



Glutathione redox ratio

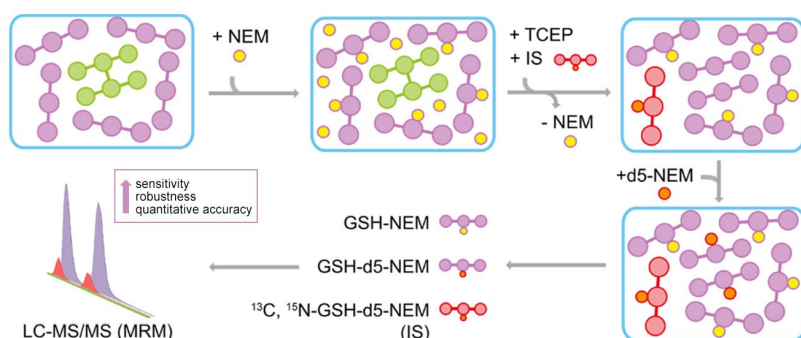
Glutathione (γ -L-glutamyl-L-cysteinyl-glycine) is the main endogenous, cellular, thiol-based antioxidant existing in reduced (GSH) and oxidized (GSSG) forms. In healthy cells, the ratio of GSH:GSSG is actively kept higher than 100:1 but different stress-conditions can affect this balance thus it can be used as a readout of cellular redox state.

BACKGROUND

Glutathione (GSH) acts as a co-factor for the enzyme glutathione peroxidase, reducing toxic peroxides and oxidizing itself to GSSG in the process. The GSH:GSSG ratio can be used as proxy for addressing cellular oxidative stress exposure but common methods suffer from artificial thiol oxidation during sample preparation and low quantitative power for GSSG.

TECHNOLOGY

We developed an optimized sample collection protocol (patented) to minimize GSH artificial oxidation and a method which greatly improves sensitivity for GSSG, dramatically reducing starting material requirement. In our two-step alkylation approach, all GSH is initially blocked with N-ethylmaleimide (NEM), after which all small thiols are reduced (including GSSG). Newly released GSH is then re-alkylated with deuterated NEM (d5-NEM). A third isotopologue can be used as isotopic standard for absolute quantification. With all isotopologues having similar chromatographic properties, matrix effects can only impact method sensitivity but not quantification accuracy.



OFFER

Under protection of a CDA/NDA we offer robust, simplified, cost effective and highly sensitive mass spectrometric glutathione analysis across a variety of different sample types. IP developed in such a project would fully belong to our investor/industrial partner.

We also look for a partner to further develop the GSH/GSSG ratio in blood into a diagnostic marker for diseases where oxidative stress plays a role. IPR to be negotiated.

EXPERT:

Dr. Matthias Schittmayer-Schantl

AVAILABLE FOR:

- Investments
- Joint Research Projects
- Contract Research

DEVELOPMENT STATUS:

Technology Readiness Level 6
(Demonstrated in relevant environment)

IPR:

Can be generated for our industrial partners / investors

KEYWORDS:

Glutathione
Oxidative stress
Antioxidant
Redox analysis
Peroxides

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